Designing Safe Spaces for Virtual Reality

Methods for merging body sovereignty theory into VR design practice.

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Abstract

Virtual Reality (VR) designers accept the ethical responsibilities of removing a user's entire world and superseding it with a fabricated reality. These unique immersive design challenges are intensified when virtual experiences become public and socially-driven. As female VR designers in 2018, we see an opportunity to fold the language of consent into the design practice of virtual reality—as a means to design safe, accessible, virtual spaces. We aim to provide the basic tools and framework required to educate and empower designers in building their own behavioral codes of conduct for the virtual world. We do so by defining social interactions with real-life space boundaries and applying the rhetoric of body ownership to designing safer virtual spaces.

New Worlds, Old Problems

Imagine it's your first time entering a social virtual reality (social VR) experience. You quickly set up an avatar, choosing feminine characteristics because you identify as female. You choose an outfit that seems appropriate, and when you're done, you spawn into a space. You have no idea where you are or who is around you. As you're getting your sea legs in this new environment, all the other avatars look at you and notice that you're different. Strange avatars quickly approach you, asking inappropriate questions about the way you look in real life, touching and kissing you without your consent. You try blocking them, but you don't know how. You remove your headset fearing that you don't belong in this community.

This narrative is based on multiple public accounts of avatar harassment in social VR applications, reported by women. In 2016, Taylor Lorenz, a staff tech writer at *The Atlantic,* shared her experience in a virtual reality room: "Within two minutes of walking into the welcome room in [...] a leading social VR app, I was given my first unsolicited 'virtual reality kiss'. Shortly after, my skinny brown-haired avatar was swarmed by male users rubbing on me and asking if I was as skinny in real life or just a fatty behind an avatar. I felt ripped from the virtual world and transported back to middle school" (Lorenz 2016). Less than two years later, popular VR platform *VRChat* publicly vowed to make safety a top priority after a female VR Game Designer shared a graphic recording of sexual harassment in a *VRChat* room (Feltham 2018). While these cases are unique in the broader harassment landscape, they are a notable facet of an emerging market. In a 2018 study conducted by Jessica Outlaw for VR communication service, *Pluto,* nearly half of the female-identifying VR participants reported at least one instance of VR sexual harassment (Outlaw 2018).

Abuse and harassment due to anonymity on the internet has been well documented since the 1990s (Subrahmanyam, Smahel and Greenfield 2006, 396-397), from trolling in chat rooms to cyberstalking and bullying on various social media platforms. And as our communication patterns evolve from text-based to immersive interactions, the perceptual physicality of VR gives harassers troubling new ways to attack. As female-identifying VR designers in 2018, we consider it our social responsibility to address abuse and harassment from an ethical design perspective and bring safety, consent, and body ownership to these foundational stages of VR.

Defining social interactions with proxemics

When designing communication in virtual environments, we can look to factors that make up our real-world environment. Proxemics—a term coined by anthropologist Edward T. Hall—refers to the relationship between your identity, your surroundings, and the social norms of the community around you (Hall 1982, 2). Proxemics can be categorized into four distinct zones: intimate, personal, social, and public (Hall 1963, 1004). The boundaries of these zones help us understand appropriacy at various distances (Hall 1982, 2).

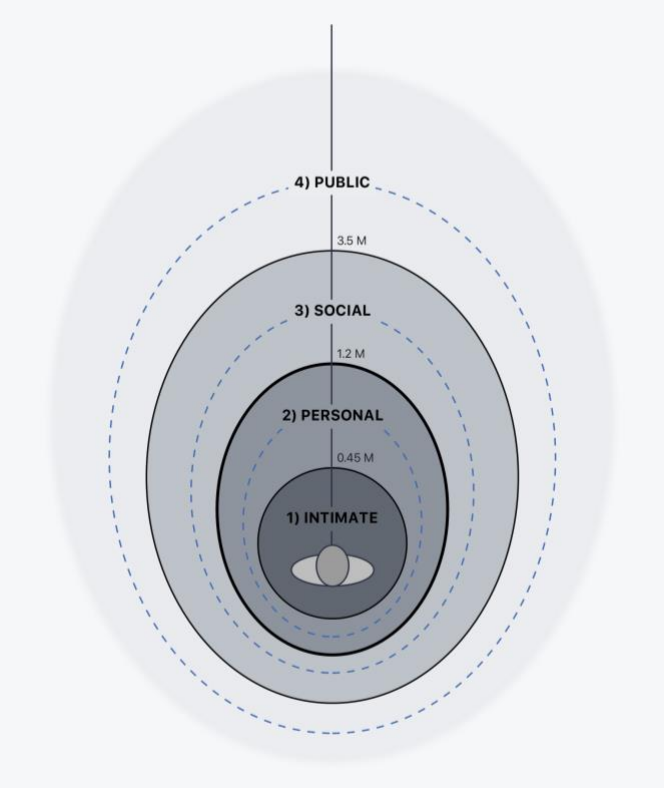

Figure 1: Illustration of Edward T. Hall's *Zones of Interpersonal Space*

For example, your bedroom is a space where intimate distance interactions can be expected, while a living room—shared with close family members—would encourage personal interactions. In contrast, a shared workspace is set up for social distance interactions. At a public space, like a park, you're able to keep a distance from other people. In locations that lack the

necessary space to maintain social or public behaviors, people may introduce additive factors, like headphones or arm placements, to convey their need for a personal safety zone.

The act of outlining and protecting embodied personal space is a requirement for mediating who is let into intimate and personal zones. While proxemics can be implied for a space, people need to feel in full control in any space and be able to decide what happens to their body. Hall demonstrates that regardless of the collective understanding of any given space, participants still have the adjacency to decide how they interact (Hall 1963, 1003). This control over our decisions is rooted in body sovereignty, the sentiment that all people should have complete ownership of their bodies and any interactions that should occur to them (Friedman and Valenti 2008, 171).

Challenges arise when spaces overlap these boundaries, like public trains. Public environments with intimate vulnerabilities have clearly defined behavioral rules to protect against inappropriate behavior between participants (Scott 2009). These guidelines, often referred to as codes of conduct, offer explicit rules for what sorts of behavior are acceptable and unacceptable within a space. Conduct codes empower body sovereignty by defining appropriacy, highlighting universal safety, and enabling participants to report misbehavior. When a code of conduct is not reinforced, additional methods of intervention can take place; often causing exclusion to those who need protection most. One example of an exclusionary experience is a female-only train car, found in countries like Japan and Brazil. "Female-only carriages were first introduced in Japan in 2000, [...] as a way to stop sexual harassment" (Sanghani 2015). When reporting options and justice procedures fail citizens, the systems are left to reactively redesign around threats, an ineffective way to build for inclusivity.

As social VR designers, we can aim to create implicitly and proactively safe social virtual communities. Using Hall's definitions of interpersonal space, we can define explicit structures for appropriate behavior and build natural boundaries in virtual social relationships.

Body sovereignty as a VR design practice

In order to craft comprehensive safety features for social VR experiences, designers should understand the social and physical complexities of these experiences. Using Hall's "Zones of Interpersonal Space" as a spatial and emotional scale to analyze different aspects of spatial experiences with virtual bodies, we will develop a design language for safe, inclusive social VR. Starting from the inner circle of intimacy, we will break down characteristics at each stage of the interpersonal space spectrum and provide examples on how to bring body sovereignty theory into VR design practice, level-by-level. This results in suggestions for consent introspection at each level of the spectrum and develops building blocks of accountable social VR conduct codes. All offered solutions are considerations and recommendations, not requirements for implementation.

Zone 1: Intimate Space

Intimate distance is the closest zone to you and starts from 0-18 inches away (0-46 cm). Because of the proximity of the presence of another person, it may be overwhelming due to stepped-up sensory inputs like smell, touch and sound. Physical contact or the possibility of physical contact is high. The challenge at this distance is to ensure that people who are within this close and intimate distance both want to be there and want to engage in activities at this proximity. Communication in real-life at this distance is nuanced and complex, and virtual

embodiment is no different. Therefore, we cannot assume that users electing to enter an intimate space together are automatically on the same page. Designers should set up proactive dialogs before the experience begins, to ensure all participants can curate their interactions to their own level of proxemic comfort. The closest, most intimate relations require the clearest, most explicit guidelines.

We can find inspiration for these proactive dialogs in the processes by which people in close relationships come to a mutual understanding for intimate experiences. We can look to paradigms for predetermining intimate agreements in various types of couplings, like "Yes, No, Maybe" charts and boundary setting tools for romantic relationships. Couples use these tools to define the boundaries of their intimate experiences before they occur. As Rachel Kramer Bussel describes in her essay, *Beyond Yes or No: Consent as Sexual Process*, it is beneficial for all participating members of an activity to have previously, and explicitly, stated their boundaries and desires; these are not contractual agreements binding participants to activities, but rather statements of previous interest or enjoyment (Friedman and Valenti 2008, 45). Bussel instructs on the usage of "Yes, No, Maybe" charts, a procedure by which individuals in close relationships may list all intimate acts imaginable and then, "categorize them into things [they] enjoy/would like to do, things [they] don't ever want to do, and things [they're] not sure about or might try under certain circumstances." (Friedman and Valenti 2008, 45). This guideline allows participants to preemptively constrain all possible future experiences and limits interactions to those that are known to be comfortable for their own body or personal space.

Yes, No, Maybe: Chart for Intimate Partners

Activity	Experience Yes/No	Willingness 0-5	Notes & Nuances
Biting	Y	3	Context-specific, ask about it
Body Paint	Y	4	
Corsets	N	0	Absolutely never, don't ask
Hugging	Y	5	Always fine
Intercourse	N	0	Possible but unlikely
Kissing	Y	4	
Rough Play	N	0	Absolutely never

Figure 2: Hypothetical example of a "Yes, No, Maybe" chart

Likewise, for individuals in polyamorous relationships—where truthful communication is required to define the experience for all parties involved—setting boundaries in advance is a critical component of healthy experiences (Balzarini et al. 2017). Particularly, participants in non-monogamous relationships "go through an explicit process of negotiation and boundary delineation, defining particular behaviors, emotions, and kinds of partners as either acceptable or off-limits" (Barker and Langdridge 2010, 16).

Furthermore, the process by which couples set comfort zones and outline emotional boundaries for their respective online social networking can be used as a parallel to how we may use proactive dialogs to build trust and satisfaction. The 2014 *Cyberpsychology* article, "Couple Boundaries for Social Networking in Middle Adulthood" posits that many married couples have pre-set boundaries for social networking, and that these agreements are associated with improved relational trust and satisfaction (Norton and Baptist 2014). Opportunities for accidental breaches are limited when couples align on each other's intentions, this process also allows for greater freedom in the pursuit of common goals (Norton and Baptist 2014).

Designing safety for intimate VR spaces

In surveying predetermined, mutual understandings of complex and intimate experiences, we can extract several social VR design principles. We can empower users by allowing them to define their ideal experience up front, to ensure that their experiences never violate their digital intimate space. One option is to supply granular controls and deploy opt-in setup dialogs *before* the user enters the social VR space. Everyone should feel that they've entered an intimate space with a clear understanding of what that relationship looks like; that they have delineated the bounds of all future interactions with ease and confidence.

Users should be prompted, through naturalized dialogs (in the software), to set their boundaries before any social interaction takes place. Experience curation should be part of initial setup, rather than reactively setting safety mechanisms following harassment or negative experience. We should provide users with sliding-scales of safety precautions for personal customization: many users with experiential concerns do not want to participate in an overprotective or limiting experience. Allowing users to pick and choose safety options allows them to curate an ideal experience, providing them a safe environment while still preserving the feeling of adventure. To facilitate sliding scales of safety options, we must offer granular controls. There is a difference between a block and a mute, and there should be some natural negotiability between these states.

Zone 2: Personal Space

Personal distance starts at 18 inches (46 cm) and goes until about 4 feet (122 cm). It is the zone for people who are not in contact with each other. It can be thought of as a protective bubble that a person maintains between themselves and others, but may allow people who they

have an established relationship with (romantic, marriage, family, close friends) to be within this circle. The challenge for virtual environments at this distance is that people have different ways of communicating, and we need to provide equal tools to everyone to be able to feel comfortable interacting in this distance. At this personal level, users must have reactionary mechanisms for empowerment, understanding, and agency.

Designers can influence intuitive tools for safety and empowerment by looking at how clinical practices secure enthusiastic consent via nonverbal behaviors, subtleties, and other varying human communication capacities. The *Social Emotional Teaching Strategies* guidebook (2012), unpacks various mechanisms for silently intuiting the feelings of others, empowering children to identify and understand emotions via feeling faces, helping them understand and support the desires of others. Furthermore, the guidebook describes, “One way to help children be more successful in developing friendship skills is to “teach” them to label, understand, express, and control emotions. [...] Children who don’t learn to use emotional language have a hard time labeling and understanding their own feelings as well as accurately identifying how others feel.” (Joseph, Strain, Yates, and Hemmeter 2012, 26).

Conjointly, the United Kingdom's Mental Capacity Act was created to protect and empower adults who may lack the mental capacity to make their own treatment decisions. The Act describes variabilities in understanding and communication and advises on adapting consent dialogs to, “A way that is appropriate to [the patient's] circumstances,” and reinforcing this dialog by prompting the patient for ongoing feedback (Tullo 2005, 6). Similarly, the United States’ National Institutes of Health has a set of rules for sensitively seeking consent from deaf and hard-of-hearing participants in clinical trials, asking that clinicians “develop informed consent materials that are responsive to the variations of language used by deaf and hard-of-

hearing people [and] consider visual information such as symbols, pictures or diagrams on the consent form to enhance understanding" (National Institutes of Health 2016).

Designing safety for personal VR space

These custom-tailored consent acquisition paradigms outline a framework for creating inclusive dialogs and reactionary tools that allow all users (regardless of their comfort levels, safety needs, or communication modes) the basic tenets of consent and experiential control. To manifest these sorts of clinical consent frameworks in social VR, designers can consider providing intuitive safety gestures to allow users to react to personal space violations quickly and fluidly. Employing gestures for this procedure feels intuitive, natural, and empowering: "We commonly think of gestures, actions, and expressions of people as being more or less characteristic of them, as embodying or revealing aspects that are more or less central to them" (Meir 1991, 966). Established, codified gestures are often used in personal interactions to communicate volumes without removing immersion.

Another consideration is to emotionally check in on our users, and keep an eye out for users who may be having negative experiences. For example, if a user has become non-communicative or attempts to report an incident and does not complete, it may be helpful to offer them assistance. Just as we should check in during any consensual activity to make sure all parties are still participating with willful intent, we should keep track of our user's levels of active, affirmative interactions.

Additionally, we can aim to provide violation-reporting tools that do not punish users by degrading their experience. Ideally, these tools should not remove the user who accesses them from the experience or provide a lessened experience during or after blocking another user.

Reporting should feel safe and integrated. These tools should be intuitive, easy to access, and provide immediate protection when deployed. Designing these tools may require consideration outside of the standard Flag, Block, Leave actions, depending on the unique dangers of the experience we are designing for. Empowering people to report is core to ethical design. If people can't report abuse, the community can't build in protection.

Zone 3: Social Space

Social space is the zone for impersonal transactions and we rely solely on what we can hear and see. Impersonal interactions and co-working tend to use this social distance. The challenge for social distance is that community behavior is guided by delicately maintained localized etiquette. In these niche social environments, participants rely on soft, unspoken rule systems to determine and validate prospective behaviors.

We can learn how to instate protective, localized behavior rules by studying the places and circumstances which have unspoken, location-based conduct agreements to keep participants safe and reduce redundant consent discourse.

First, we can look to localized social conduct codes set by colleges to prevent on-campus sexual assault. In 2014, California Governor Jerry Brown signed a Senate Bill, informally known as the "Yes Means Yes" bill, into law, enacting "a definition of sexual consent known as 'affirmative consent' for all state-funded colleges in California". This bill establishes and instates a specialized, context-specific, soft rule set for all consent-adjacent interactions within California schools. Colleges and universities found to not enact said rules, may be denied their contracted state funding (Morrison 2017). College campus social codes promoting affirmative consent first became a part of popular culture in the early 1990s when Antioch College adopted the "Sexual

Offense Prevention Policy" (SOPP). SOPP provided "a definition of consent that requires an active, verbal offering of permission, as opposed to a lack of refusal, to a sexual encounter of any degree," (Morrison 2017) as a means to prevent sexual misconduct. At Antioch, opting into life on the premises served as a silent agreement to laws of SOPP.

As mentioned earlier, in specialized social spaces like community gyms and swimming pools, participants follow unspoken rules, routines, and rituals to respect the private space of the fellow patrons around them (Scott 2009). Susie Scott notes that participants perform as "disinterested strangers" and are surprisingly "orderly and civilized" (Scott 2009, 126) due to a an unspoken agreement to respect other people's personal space and experiential intention. Individuals who opt to enter these sorts of specialized spaces, silently consent to the soft, localized laws of the area; and do so to maintain the experience of all participants.

Designing safety for social VR space

Localized rules and behavioral agreements in niche social environments provide a framework for implementing soft laws into our social VR spaces. This is particularly important when our virtual worlds reference real-world locations. For example, popular social VR app, *Rec Room*, borrows the metaphor of a real-world space, without considering the real-world codes of conduct in that space. Katharine Schwab, in a recent *Fast Company Design* article, describes the *Rec Room* virtual space as resembling a recreational facility run by the *YMCA*, a charitable organization and wellness center, "where participants can play games like dodgeball and paintball in a group. When first-time users enter the space, they begin in a locker room that everyone shares" (2018). She goes on to describe her own experience entering the space and her

previous frame of reference that a locker room may not be an inclusive environment and is “a space that’s already fraught with misogyny for many women.”

To prevent the discomfort experienced by Schwab in *Rec Room*, one consideration is to exhibit specialized rule sets fit to the unique social needs and challenges of a space’s use case. Just as all specialized real-world spaces have unique and unspoken behavioral agreements, all specialized, mid-size virtual spaces require unique consideration for the prospective boundaries that should exist to maintain the intended experience of the space, for all users. “Different VR systems or types of [Virtual Embodiments] provide different frames for our encounter [and] if this applies to individual encounters and how we present ourselves to each other, it will also apply to larger groups” (Schroeder 2002).

We can maximize user comfort by proactively understanding subtleties in interactions as an ongoing service to our users’ emotional experience. Because VR can actuate a full gamut of emotions that can be internalized as real (Metzinger, 2003), we should be on the lookout—via signals users provide us—for such trauma. It is our responsibility as designers to use this information in a positive, constructive and accountable way, to better understand emotional distress in our users and dispatch helpful prompts in at-risk events.

Zone 4: Public Space

Public space describes the 12-20 foot (3-6 m) communication distance from which it is harder to read body language and tone. Comparative to shopping malls or public parks, public spaces are open to any and all people. We can prevent the design of lawless and dangerous worlds, both physical and virtual, by fostering spaces that provide capacity for communication and expression, opportunity to exercise free will, and accountability for offensive actions. We

should do so by building small sets of hard laws and respective consequences—based on legal definitions of safety and consent—for world-scale, public social VR experiences.

We can look to real-world law systems—their definitions of consent, evaluations of behavior violations, and the consequences that befall conduct criminals—to find inspiration in designing ethical social VR infrastructure and contributing to a universal VR behavioral code.

First, we could survey legal definitions of consent and the hard-line laws that support them. In the US, consent has no federally standardized legal definition. The State of California defines consent as, “positive cooperation in act or attitude pursuant to the exercise of free will. The person must act freely and voluntarily and have knowledge of the nature of the act or transaction involved” (Morrison 2017). Despite varying legal definitions of consent, there are various instances in which sexual acts are universally considered to be non-consensual or criminal. Many of these universally criminal incidences exist when a participant is incapable of understanding their circumstances, whether due to intoxication, mental deficiency, or through being “under the age of legal consent, [or] of an age where sex is not lawful” (Corinna 2013, 4)

Additionally, we can look to repercussions for non-consensual behavior and their effect on the public collective consciousness: “The convictions and sentences of rape cases, especially in the age of new media, preach a moral lesson about who and what the U.S. legal system identifies as an actor in sexual assault” (Morrison 2017). In England’s *R v Sussex Judges* case, Lord Hewitt argued, "Not only must Justice be done; it must also be seen to be done." High-profile, publicly documented consent violation trials help to “invigorate the movement for more comprehensive consent education”—public lessons gleaned from these cases have the opportunity to fuel conversation and “build momentum for greater awareness and attention to sexual assault and consent” (Morrison 2017).

Designing safety for public VR space

The above examples address how we publically establish law, consequence, and behavioral expectation in regards to consent and violations of consent in the real world. By studying these legal structures, we can derive key principles for designing universal ethical codes and behavioral expectations in public social VR experiences, and across the industry.

In order to design truly safe, public VR spaces, one approach is to establish a universal policy system to protect against unethical behavior and commonly offensive content. In the paper, "Real Virtuality: A Code of Ethical Conduct", Madary, Michael and Thomas K. Metzinger stress that high level ethical systems in VR help to reinforce user agency (2016). They continue on to posit that certain types of VR content and experiences should be discouraged in various ways, "obvious candidates for such content would be sex (virtual pedophilia, virtual rape) and violence." (Madary and Metzinger, 2016).

We should also ask our users to consider the proxemic comfort zones of our real-world bodies and the bodies of those they interact with, when participating in public social VR experiences. This reconsideration isn't as far-fetched as it seems: contemporary developments in cognitive neuroscience and body ownership describe the 'rubber hand illusion' in which a "visible rubber hand that is located in a plausible position in front of [a test subject] results in the illusion that the rubber hand is their hand." (Slater 2009). In the same way, "Virtual reality can transform not only your sense of place, and of reality, but also the apparent properties of your own body" (Slater 2009). We can utilize this embodiment to set conduct rules that mirror standards of the acceptable social experiences for our real world bodies. "A reasonable starting point on this issue would be to treat avatars in an analogous manner to personality rights relating

to the publication of photos. [...] Just as many accept the right of an individual to control the commercial use of his or her name, image, likeness, one might, for example, interpret the 'right to my own avatar' a property right as opposed to a personal right" (Madary and Metzinger, 2016). This option is not always possible—particularly for commercial experiences—but helps foster user agency when available.

And lastly, we should establish universal conduct expectations by administering timely and appropriate consequences to violators. Public VR spaces should echo the public laws we live within every day, because, "virtual identification can cause real suffering, and real suffering is relevant for the law." (Madary and Metzinger, 2016). Plus, virtual repercussions for behavior violations in virtual space could be good for our real-world lives, as it has been noted that, "virtual reality experiences have lasting effects even after users have left a virtual environment" (Oberhaus 2016). What's good for the virtual world, could be good for the physical world.

Beyond the Zones

As Social VR designers, we hold the unique opportunity to create worlds unbound by reality's constraints. When approaching the responsibility of constructing new social environments—regardless of how surreal they may be—we should remind ourselves to treat virtual embodiment with the same respect given to physical bodies. It is our responsibility to design innately safe virtual spaces and interactions, laying the groundwork for a future of inclusive, secure and empowering VR communities.

And finally, when applying this methodology of virtual body sovereignty, remember that it is a singular framework, and not an end-all solution. As Social VR matures, more opportunities will arise to translate real-world ethics into virtual ethics. We should be actively and

continuously looking to real-world interaction frameworks—like Hall's zones of interpersonal space—and appropriating relevant ethical structures into our VR creations.

A safe future is in our virtual hands.

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